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| 10/689,207 | 10/20/2003 | Huai-Rong Shao | MERL-1502 | 4453 |

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MITSUBISHI ELECTRIC RESEARCH LABORATORIES, INC.
201 BROADWAY
8TH FLOOR
CAMBRIDGE, MA 02139

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| EXAMINER |
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DUONG, CHRISTINE T

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| ART UNIT | PAPER NUMBER |
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2616

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06/11/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/689,207 | SHAO ET AL. | |
| | Examiner | Art Unit | |
| | Christine Duong | 2616 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-4, 6 and 7 is/are rejected.
- 7) Claim(s) 5, 8 and 9 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 October 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)✓
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)✓
 Paper No(s)/Mail Date 10/12/03

- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Information Disclosure Statement

The references listed in the Information Disclosure Statement, filed on 20 October 2003, have been considered by the examiner (see attached PTO-1449 form or PTO/SB/08A and 08B forms).

Specification

1. The disclosure is objected to because of the following informalities: In Page 4, paragraph [016], according to Applicant's disclosure, it is suggested to change "Periodically, the client 102 makes a request to receive streamed data from the server 102" to --Periodically, the client 102 makes a request to receive streamed data from the server 101--. Appropriate correction is required.

Claim Objections

2. **Claim 3** is objected to because of the following informalities: the limitation "the data" recited in Line 2 does not have sufficient antecedent basis. It is believed "the data" is meant to say --a streaming data--. For the examination on the merits, the claim will be interpreted as best understood. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1-2, 4, and 7** are rejected under 35 U.S.C. 102(e) as being anticipated by Varadarajan et al. (PG Pub US 2004/0255323 A1).

Regarding **Claim 1**, Varadarajan et al. discloses a method for selecting multiple paths between a server (**the following elements alone or in combination of video server 104 and edge node 108, Fig. 1**) and a client (**video client 102, Fig. 1**) in an overlay network (**streaming overlay network 114, Fig. 1**) having a plurality of nodes connected by links ("Each node, edge or core, has one or more links and these links interconnect the nodes of the SON", [0050] Lines 2-4), the plurality of nodes including the server and the client (**video server 104, source edge node 108, core node 110, video client 102, etc., Fig. 1**), each path including a set of selected links, comprising:

measuring, in each node, quality of service metrics of each link directly connecting the node to an immediate neighboring node ("Each node monitors the health of the associated links", [0050] Lines 20-21);

transmitting the metrics to the server ("each node ... communicates any change in BW availability to edge nodes by multicasting", [0050] Lines 23-25);

maintaining, in the server, the metrics, a link correlation matrix ("Connectivity/Available bandwidth Matrix 408 contains the most recent information related to the bandwidth availability between any two neighboring nodes", [0045] and Fig. 4) based on the metrics, and a path correlation matrix ("BW Table 410 provides a node-wise consolidated information regarding total and

available bandwidth”, [0045] and Fig. 4) based on the link correlation matrix (“Connectivity/Available Bandwidth Matrix (ABW), maintained by each edge node, contains the available bandwidth between a pair nodes that are directly connected via a link” and “the load on the SON is directly controlled by the edge nodes of the SON and these edge nodes keep track of the status of each of the core nodes such as available bandwidth and available cache space. Entire traffic through the SON is controlled by these edge nodes (812)”, [0050]); and

selecting the multiple paths based only on the metrics, the link correlation matrix, and the path correlation matrix (“the route determination involves identifying a best possible sub-path from a given node towards the target edge node with as much bandwidth as possible”, [0053] and Fig. 11).

Regarding **Claim 2**, Varadarajan et al. discloses everything claimed as applied above (see *Claim 1*). In addition, streaming data from the server to the client via the multiple paths (“stream a video from a server to a client”, [0036] Line 1 and “the route determination involves identifying a best possible sub-path from a given node towards the target edge node with as much bandwidth as possible”, [0053] Lines 2-5).

Regarding **Claim 4**, Varadarajan et al. discloses everything claimed as applied above (see *Claim 2*). In addition, the streaming data are multimedia (“stream a video from a server to a client”, [0036] Line 1).

Regarding **Claim 7**, Varadarajan et al. discloses everything claimed as applied above (see *Claim 1*). In addition, the measuring, transmitting, maintaining, and

selecting are performed dynamically and periodically over a time window (“**the available bandwidth is dependent on status of links and nodes, and this status needs to be tracked continuously to maintain an accurate estimate of the available bandwidth**”, [0050] Lines 17-20).

5. **Claim 1** is rejected under 35 U.S.C. 102(e) as being anticipated by Perkins et al. (US Patent No. 6,930,983 B2).

Regarding **Claim 1**, Perkins et al. discloses a method for selecting multiple paths (“**plural paths**”, Column 6, Line 23) between a server (**the following elements alone or in combination of source 103 and list server 151, Fig. 1**) and a client (**destination 105, Fig. 1**) in an overlay network (**network cloud 100, Fig. 1**) having a plurality of nodes connected by links (**Fig. 1**), the plurality of nodes including the server and the client (**source 103, intermediate node 131, intermediate node 133, etc., Fig. 1**), each path including a set of selected links (**paths 117 and 119, Fig. 1**), comprising:

measuring, in each node, quality of service metrics of each link directly connecting the node to an immediate neighboring node; transmitting the metrics to the server (“**the source node 103 itself alternatively tests the network by sending test packets and gathers QoS data, QoS median/average, and QoS correlation statistics on various intermediate nodes**”, Column 17, 30-33);

maintaining, in the server, the metrics, a link correlation matrix (“**Link Matrix 2121, Fig. 21**”) based on the metrics, and a path correlation matrix (“**Hops Table 2131, Fig. 21**”) based on the link correlation matrix (“**source 103 builds up a list of intermediate nodes and their correlations**”, Column 17, Lines 42-43); and

selecting the multiple paths based only on the metrics, the link correlation matrix, and the path correlation matrix (“**at least one pair of suitable paths are selected depending on a search condition**”, Column 32, Lines 38-39).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadarajan et al. further in view of Menon et al. (PG Pub US 2002/0152318 A1).

Regarding **Claim 3**, Varadarajan et al. discloses everything claimed as applied above (see *Claim 1*). However, Varadarajan et al. fails to specifically disclose that storing a copy of the data only at the server, as claimed.

Nevertheless, Menon et al. teaches “**content such as an audio or video object is stored on a single object server only**” (**Menon et al.: [0009]**).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Varadarajan et al.’s system to only store a copy of the video at the server because of better “**content delivery network architectures and operational schemes**” (**Menon et al.: [0008]**).

8. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadarajan et al. further in view of Klinker et al. (PG Pub US 2003/0088671 A1).

Regarding **Claim 6**, Varadarajan et al. discloses everything claimed as applied above (see *Claim 1*). Additionally, Varadarajan et al. discloses that the metrics include bandwidth (**Connectivity Matrix/ABW Matrix 408 and BW Table 410, Fig. 4**), latency (**Expected End Time in Video Streams 404, Fig. 4**). However, Varadarajan et al. fails to specifically disclose that the metrics include packet loss rate of the link, as claimed.

Nevertheless, Klinker et al. teaches “**a rule can set: ... the maximum load or bandwidth usage associated with traffic flows through specific providers; ... the maximum acceptable latency or loss over one or more paths across multiple network service providers ... Flow control system 90 further operates to detect when one or more rules, or flow policies, are violated and then to take remedial action**” (Klinker et al.: [0055-0056]).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Varadarajan et al.’s metrics to include bandwidth, latency and loss because it will allow “**Internet customers to manage the bandwidth across multiple providers in terms of at least cost, bandwidth, performance (in terms of packet loss, latency and jitter), etc.**” (Klinker et al.: [0013]).

Allowable Subject Matter

9. **Claims 5, 8 and 9** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Citation of Pertinent Prior Art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Iwata (US Patent No. 5,933,425) discloses a source routing for connection-oriented network with repeated call attempts for satisfying user-specified QoS parameters.

Ricciulli (US Patent No. 6,778,502 B2) discloses on-demand overlay routing for computer-based communication networks.

Peres (US Patent No. 7,062,548 B1) discloses a multimedia communications resource management control system and method.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Duong whose telephone number is (571) 270-1664. The examiner can normally be reached on Monday - Friday: 830 AM-6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2616

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Seema S. Rao
6/17/07

CTD 06/07/2007 CTD

SEEMA S. RAO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600